IN THE CLAIMS:

1-13. (Canceled)

14. (Previously presented) A batch process for producing a copper-containing aqueous solution product comprising between 100 and 130 grams of dissolved copper per liter, said process comprising:

providing to a batch reactor an initial aqueous leach liquor comprising water, monoethanolamine, and $(HMEA)_2CO_3$, wherein said $(HMEA)_2CO_3$ is produced by partially carbonating a composition comprising aqueous monoethanolamine;

providing to the batch reactor a copper mass, wherein the molar ratio of copper in the copper mass to total monoethanolamine in the composition is greater than 1 to3.5;

providing to the batch reactor air, oxygen, or mixture thereof; and

contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass, thereby causing dissolution of a portion of the copper mass and forming the copper-containing aqueous solution product, wherein the temperature of the leach liquor is maintained at a temperature between 25° C and 100° C, wherein the amount of dissolved copper in the copper-containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 12 hours or less.

15. (Previously presented) The process of claim 14, wherein the step of partially carbonating the monoethanolamine comprises contacting an aqueous monoethanolamine composition with carbon dioxide, wherein the initial aqueous leach liquor comprises between about 30% and about 40% by weight of total monoethanolamine and between about 8% and about 12% by weight of carbon dioxide.

16. (Previously presented) The process of claim 14, wherein the amount of dissolved copper in the copper-containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 8 hours or less.

17. (Previously presented) The process of claim 14, wherein the temperature of the leach liquor is maintained at a temperature between 45° C and 65° C, and wherein the amount of

dissolved copper in the copper-containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 8 to 12 hours.

18. (Previously presented) The process of claim 14, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C, and wherein the amount of dissolved copper in the copper-containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 8 hours or less.

19. (Previously presented) The process of claim 15, wherein the temperature of the leach liquor is maintained at a temperature between 45° C and 65° C, and wherein the amount of dissolved copper in the copper-containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 8 hours or less.

20. (Previously presented) The process of claim 14, wherein the initial aqueous leach liquor further comprises at least 1.9 grams of dissolved copper per liter of initial aqueous leach liquor.

21. (Previously presented) The process of claim 14, wherein the initial aqueous leach liquor further comprises at least 13.7 grams of dissolved copper per liter of initial aqueous leach liquor.

22. (Previously presented) The process of claim 14, wherein the initial aqueous leach liquor further comprises between 1.9 grams and 13.7 grams of dissolved copper per liter of initial aqueous leach liquor.

23. (Previously presented) The process of claim 14, wherein the step of contacting the leach liquor with the copper mass comprises circulating the aqueous leach liquor through the batch reactor with a circulation pump, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor.

24. (Previously presented) The process of claim 23, wherein said circulating comprises withdrawing aqueous leach liquor from the batch reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

25. (Previously presented) The process of claim 23, wherein said circulating comprises withdrawing aqueous leach liquor at a rate of about 0.1 to 0.182 of the aqueous leach liquor volume per minute from the batch reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

26. (Previously presented) The process of claim 14, wherein the step of contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass comprises circulating the aqueous leach liquor through the batch reactor with a circulation pump, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor, and sparging the air, oxygen, or mixture thereof upward through the copper mass and aqueous leach liquor.

27. (Previously presented) The process of claim 26, wherein said circulating comprises withdrawing aqueous leach liquor from the batch reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

28. (Previously presented) The process of claim 26, wherein said circulating comprises withdrawing aqueous leach liquor at a rate of about 0.1 to 0.182 of the aqueous leach liquor volume per minute from the batch reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

29. (Previously presented) The process of claim 14, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C

30. (Previously presented) The process of claim 14, further comprising maintaining the pH of the aqueous leach liquor between about 8 and about 11.3 by adding monoethanolamine as a base and carbon dioxide as an acid.

31. (Previously presented) The process of claim 14, further comprising maintaining the pH of the aqueous leach liquor between about 9 and about 10.

32. (Previously presented) The process of claim 14, wherein the aqueous leach liquor is free of alkali metal hydroxides.

33. (Previously presented) The process of claim 14, wherein the aqueous leach liquor is free of polyamines and alcohols.

34. (Previously presented) The process of claim 14, wherein the aqueous leach liquor is free of carboxylic acids.

35. (Previously presented) The process of claim 14, wherein the aqueous leach liquor is free of ammonium hydroxide.

36. (Previously presented) The process of claim 14, wherein the molar ratio of copper to total monoethanolamine in the copper-containing aqueous solution product is less than 1 to 3.5.

37. (Previously presented) The process of claim 14, wherein the weight of the copper mass provided to the batch reactor is between 2/3 and 1 grams per ml of aqueous leach liquor provided to the batch reactor.

38. (Previously presented) The process of claim 14, wherein the step of contacting the leach liquor with the air, oxygen, or mixture thereof comprises immersing the copper mass in the aqueous leach liquor, wherein the copper mass is a three dimensional open network that is permeable to the leach liquor, and introducing the air, oxygen, or mixture thereof at a point

below the top of the leach liquor such that the air, oxygen, or mixture thereof migrates upward through the aqueous leach liquor contacting the copper mass.

39. (Previously presented) The process of claim 14, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C.

40. (Previously presented) The process of claim 39, wherein the pH of the aqueous leach liquor is between about 8 and about 11.3.

41. (Previously presented) The process of claim 39, wherein air is provided to the batch reactor at a rate of between about 2 and about 20 standard cubic feet per hour per liter of the total volume of the leach liquor and the copper.

42. (Previously presented) The process of claim 14, wherein the batch reactor is an aerated packed tower containing the copper mass and the aqueous leach liquor, wherein the aqueous leach liquor is circulated from the bottom of the packed tower to the top of the packed tower.

43. (Previously presented) The process of claim 14, wherein the average rate of dissolution of copper mass is at least 17 grams of copper metal dissolved per liter of aqueous leach liquor per hour.

44. (Previously presented) The process of claim 14, wherein the batch reactor is adapted to be rotated while being aerated.

45. (Previously presented) The process of claim 14, wherein the weight of the copper mass provided to the batch reactor is between 2/3 and 1 grams per ml of aqueous leach liquor provided to the batch reactor, and wherein the copper mass comprises irregular shaped pieces having an average dimension of about 1 inch to about 3 inches.

46. (Previously presented) The process of claim 14, the copper mass comprises copper wire.

47. (Previously presented) The process of claim 14, the copper mass consists essentially of copper tubing, copper cabling, copper plates, copper wire, blister shot, or any mixture thereof.

48. (Previously presented) A continuous process for producing a copper-containing aqueous solution product, said process comprising:

providing to a continuous reactor in the form of a tower substantially packed with copper mass;

providing an aqueous leach liquor comprising water, a first concentration of dissolved copper, monoethanolamine, and $(HMEA)_2CO_3$, wherein said $(HMEA)_2CO_3$ is produced by contacting aqueous monoethanolamine with carbon dioxide, and wherein the temperature of the aqueous leach liquor is maintained at a temperature between 25° C and 100° C;

providing to the continuous reactor air, oxygen, or mixture thereof; and

contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass, thereby causing dissolution of a portion of the copper mass and forming the copper-containing aqueous solution product comprising a second concentration of dissolved copper, wherein the second concentration is higher than the first concentration and is between 100 and 130 grams of dissolved copper per liter, and wherein the copper dissolution rate is between about 3.65 and about 9.27 grams of copper mass dissolved per liter of aqueous leach liquor per hour.

49. (Previously presented) The process of claim 48, wherein the step of partially carbonating the monoethanolamine comprises contacting an aqueous monoethanolamine composition with carbon dioxide, and wherein the aqueous leach liquor comprises between about 30% and about 40% by weight of total monoethanolamine and between about 5% and about 30% by weight of carbon dioxide.

50. (Previously presented) The process of claim 48, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C.

51. (Previously presented) The process of claim 48, wherein the temperature of the leach liquor is maintained at a temperature between 45° C and 65° C.

52. (Previously presented) The process of claim 48, wherein the step of providing an aqueous leach liquor comprising water, a first concentration of dissolved copper, monoethanolamine, and $(HMEA)_2CO_3$ comprises:

providing a first portion of copper-containing aqueous solution product previously produced,

admixing with the first portion a second portion of aqueous monoethanolamine, and

adding carbon dioxide to maintain the pH of the resultant aqueous leach liquor comprising the first concentration of dissolved copper at a value between 8 and 11.3.

53. (Previously presented) The process of claim 52, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C.

54. (Previously presented) The process of claim 52, wherein the temperature of the leach liquor is maintained at a temperature between 45° C and 65° C.

55. (Previously presented) The process of claim 52, wherein the pH of the aqueous leach liquor is maintained between about 9 and about 10.

56. (Previously presented) The process of claim 48, wherein the weight of the copper mass is between 2/3 and 1 grams per ml of aqueous leach liquor.

57. (Previously presented) The process of claim 48, wherein the step of contacting the leach liquor with the air, oxygen, or mixture thereof comprises immersing the copper mass in the aqueous leach liquor, wherein the copper mass is a three dimensional open network that is permeable to the leach liquor, and introducing the air, oxygen, or mixture thereof at a point below the top of the leach liquor such that the air, oxygen, or mixture thereof migrates upward through the aqueous leach liquor contacting the copper mass.

58. (Previously presented) The process of claim 57, wherein air is provided to the continuous reactor at a rate of between about 2 and about 20 standard cubic feet per hour per liter of the total volume of the leach liquor and the copper.

59. (Previously presented) The process of claim 57, wherein the continuous reactor is an aerated packed tower containing the copper mass and the aqueous leach liquor, wherein the aqueous leach liquor is circulated from the bottom of the packed tower to the top of the packed tower.

60. (Previously presented) The process of claim 48, wherein the continuous reactor is adapted to be rotated while being aerated.

61. (Previously presented) The process of claim 48, wherein the weight of the copper mass provided to the continuous reactor is between 2/3 and 1 grams per ml of aqueous leach liquor provided to the continuous reactor, and wherein the copper mass comprises irregular shaped pieces having an average dimension of about 1 inch to about 3 inches.

62. (Previously presented) The process of claim 48, the copper mass comprises copper wire.

63. (Previously presented) The process of claim 48, the copper mass consists essentially of copper tubing, copper cabling, copper plates, copper wire, blister shot, or any mixture thereof.

64. (Previously presented) The process of claim 48, wherein the step of contacting the leach liquor with the copper mass comprises circulating the aqueous leach liquor through the continuous reactor with a circulation pump, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor.

65. (Previously presented) The process of claim 64, wherein said circulating comprises withdrawing aqueous leach liquor from the batch reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

66. (Previously presented) The process of claim 64, wherein said circulating comprises withdrawing aqueous leach liquor at a rate of about 0.1 to 0.325 of the aqueous leach liquor volume per minute from the continuous reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass.

67. (Previously presented) The process of claim 48, wherein the step of contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass comprises circulating the aqueous leach liquor through the batch reactor with a circulation pump, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor, and sparging the air, oxygen, or mixture thereof upward through the copper mass and aqueous leach liquor.

68. (Previously presented) A process for producing a copper-containing aqueous solution product, said process comprising:

providing to a reactor an initial aqueous leach liquor comprising water, monoethanolamine, and $(HMEA)_2CO_3$, wherein said $(HMEA)_2CO_3$ is produced by partially carbonating aqueous monoethanolamine;

providing to the reactor a copper mass, wherein the weight of the copper mass provided to the batch reactor is between 2/3 and 1 grams per ml of aqueous leach liquor provided to the reactor;

providing to the reactor air, oxygen, or mixture thereof; and

contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass, thereby causing dissolution of a portion of the copper mass and forming the copper-containing aqueous solution product, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C, wherein the amount of dissolved copper in the copper-

containing aqueous solution product is between 100 grams per liter and 130 grams per liter in 12 hours or less.

69. (Previously presented) The process of claim 68, wherein the step of contacting the leach liquor with the copper mass comprises circulating the aqueous leach liquor by withdrawing aqueous leach liquor from the reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor, and providing the air, oxygen, or mixture thereof at a location below the copper mass.

70. (Previously presented) A process for producing a copper-containing aqueous solution product, said process comprising:

providing to a reactor an initial aqueous leach liquor comprising water, monoethanolamine, and $(HMEA)_2CO_3$, wherein said $(HMEA)_2CO_3$ is produced by partially carbonating aqueous monoethanolamine;

providing to the reactor a copper mass, wherein the copper mass is a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor, and wherein the amount of copper mass is such that the height of the copper mass is substantially the same as the height of the top surface of the aqueous leach liquor;

providing to the batch reactor air, oxygen, or mixture thereof; and

contacting the leach liquor with the air, oxygen, or mixture thereof and with the copper mass, thereby causing dissolution of a portion of the copper mass and forming the copper-containing aqueous solution product, wherein the temperature of the leach liquor is maintained at a temperature between 40° C and 80° C, wherein the average dissolution rate of copper is at least 17 grams per hour per liter of aqueous leach liquor.

71. (Previously presented) The process of claim 70, wherein the step of contacting the leach liquor with the copper mass comprises circulating the aqueous leach liquor by withdrawing aqueous leach liquor from the reactor at a location below the copper mass and reintroducing the withdrawn aqueous leach liquor at a location above the copper mass, wherein the copper mass is

a three dimensional open network that is immersed in the leach liquor and is permeable to the leach liquor, and providing the air, oxygen, or mixture thereof at a location below the copper mass.